Mod-HSA

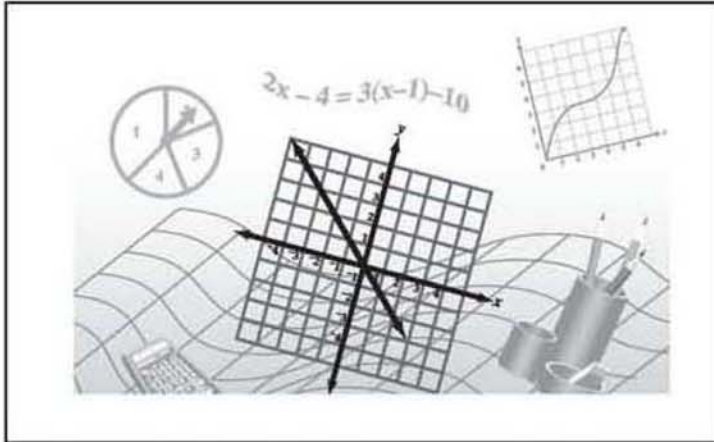MARYLAND STATE DEPARTMENT OF
EDUCATION
Achievement Matters Most

Practice Test for

Mod-HSA Algebra/Data Analysis
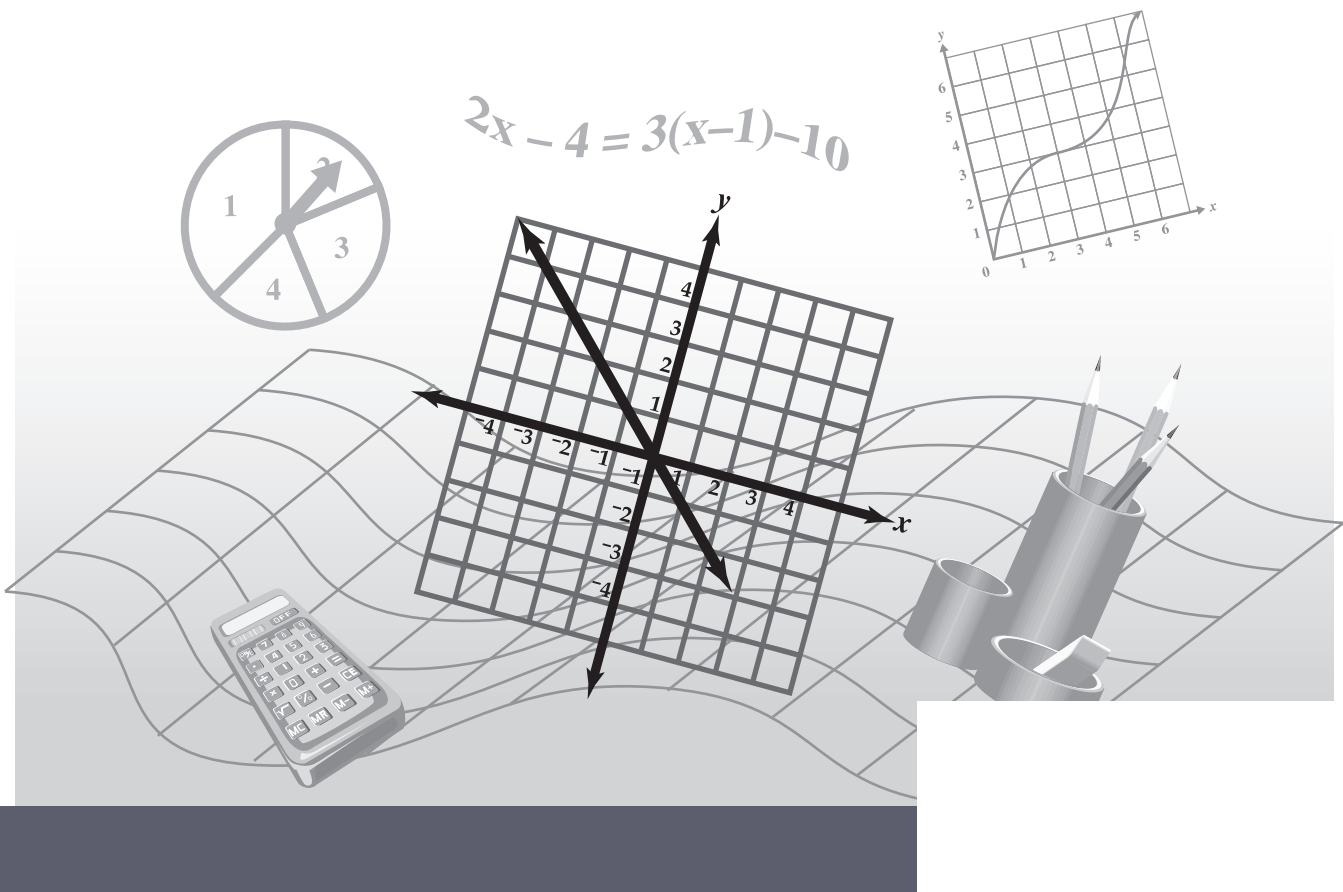
Welcome to the Mod-HSA Practice Test.

This sample test is designed to provide sample items and allow LEAs, Schools, and Students to review and practice samples of the types of items that will appear on the Mod-HSA Test. The items in this test are samples only, and do not cover the entire range of each content area which will be tested on the actual operational test forms.

- Section 1 is Mod-Algebra/Data Analysis (items 1 – 30) [begins on page 3]

Mod-HSA

MARYLAND STATE DEPARTMENT OF
EDUCATION
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Mod-ALGEBRA/ DATA ANALYSIS

$$2x - 4 = 3(x-1)-10$$

1 **The matrices below show the number of students that participate in performing arts at Valley High School.**

PERFORMING ARTS PARTICIPATION

	Males Grade 9	10	11	12		Females Grade 9	10	11	12
Chorus	6	5	10	3	Chorus	4	7	12	2
Band	11	9	3	7	Band	2	0	1	1
Dance	7	12	11	9	Dance	5	8	13	11

What performing art has the greatest number of 11th-grade students?

A Chorus

B Band

C Dance

2 **Look at the pattern below.**

$$a + 5,\ 2a + 8,\ 3a + 11,\ 4a + 14,\ \ldots$$

If the pattern continues, what is the next term?

A $4a + 17$

B $5a + 14$

C $5a + 17$

3 **Shoes are on sale for 25% off the original price.**

- **The original price of the shoes is y dollars.**

Which expression represents the sale price of the shoes?

A $y - 0.25$

B $0.25y - y$

C $y - 0.25y$

4   **The table below shows the number of geese living at Wildlife Park from February through October.**

GEESE AT WILDLIFE PARK

Month	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
Number of Geese	60	161	178	188	203	228	196	180	172

- **The mean of the data is 174.**
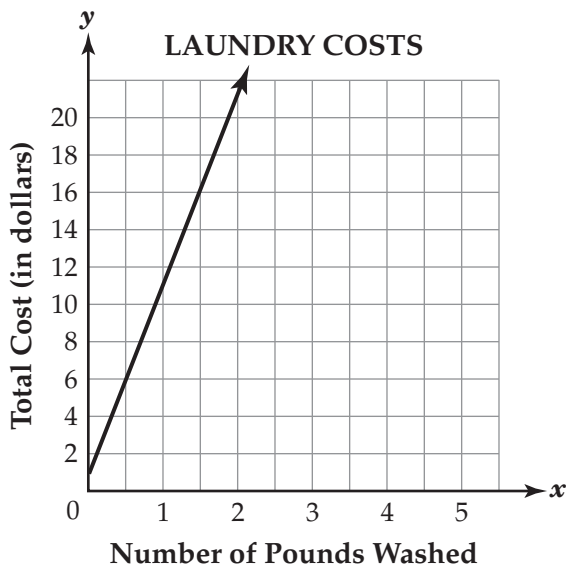
- **The median of the data is 180.**

Which statement best explains why the mean is less than the median?

A   The data set only includes 9 months.

B   The range of the data set is very large.

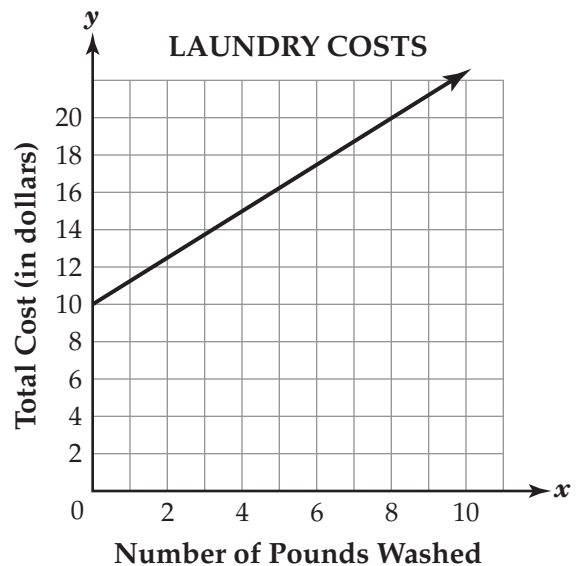**C**   The minimum value of 60 is well below the other numbers in the data set.

5 A laundry service charges Wes $10.00 plus an additional $1.25 per pound to wash his laundry.

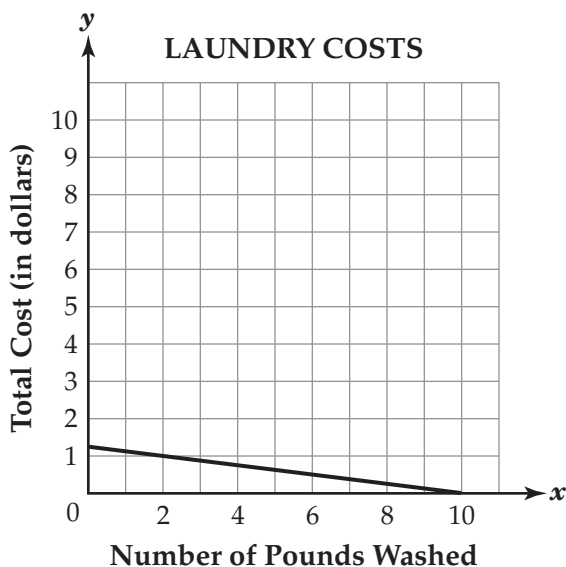Which graph represents the relationship between the number of pounds of laundry washed (*x*) and the total cost (*y*)?

A

LAUNDRY COSTS

Total Cost (in dollars)

Number of Pounds Washed

C

LAUNDRY COSTS

Total Cost (in dollars)

Number of Pounds Washed

B

LAUNDRY COSTS

Total Cost (in dollars)

Number of Pounds Washed

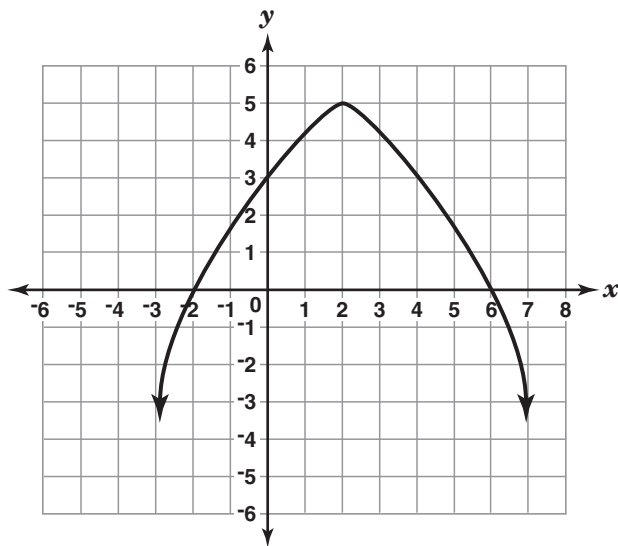**6** **Look at the inequality below.**

$$^-2x \leq 6$$

Which of these best describes the solution of this inequality?

A $x \geq 3$

B $x \geq {}^-3$

C $x \leq {}^-3$

7 **Look at the function below.**

What is the maximum value of this function?

A   2

B   5

C   6

8 **The table below shows a relationship between x and y.**

x	y
⁻5	14
-1	6
2	0
4	-4

Which equation describes this relationship?

A $\quad y = 2x - 4$

B $\quad y = {}^{-}2x + 4$

C $\quad y = {}^{-}\dfrac{1}{2}x + 2$

9   **Mary has two job offers.**

- **One job pays $8.00 an hour plus a $100 bonus.**

- **The other job pays $8.50 an hour plus an $80 bonus.**

How many hours would Mary have to work to earn the same amount of money at either job?

A   4

B   40

C   41

10 **The table below shows the age and the value of a computer.**

VALUE OF A COMPUTER

Age (in Years) (x)	Value (y)
0	$800
1	$620
2	$410
3	$200

Which is an equation for a line of best fit for this data?

A $y = {}^-201x + 809$

B $y = 201x - 809$

C $y = {}^-201 + 809x$

11 **The table below shows the age and the value of a computer.**

VALUE OF A COMPUTER

Age (in Years) (x)	Value (y)
0	$800
1	$620
2	$410
3	$200

Which of these is the meaning of the slope of an equation for a line of best fit for these data?

A the value of the computer when it was bought

B the amount that the value of the computer decreases per year

C the age of the computer depends on the value of the computer

12 **The table below shows the age and the value of a computer.**

VALUE OF A COMPUTER

Age (in Years) (x)	Value (y)
0	$800
1	$620
2	$410
3	$200

Why is it <u>not</u> reasonable to use the equation for the line of best fit to predict the value of a computer that is 6 years old?

A The age of 6 years is not in the table.

B The slope of the equation is negative.

C The value of the equation is less than zero when $x = 6$.

13 **Max needs a wooden brace for his gate shown below.**

- **The formula $c = \sqrt{a^2 + b^2}$ can be used to find the length of the brace.**

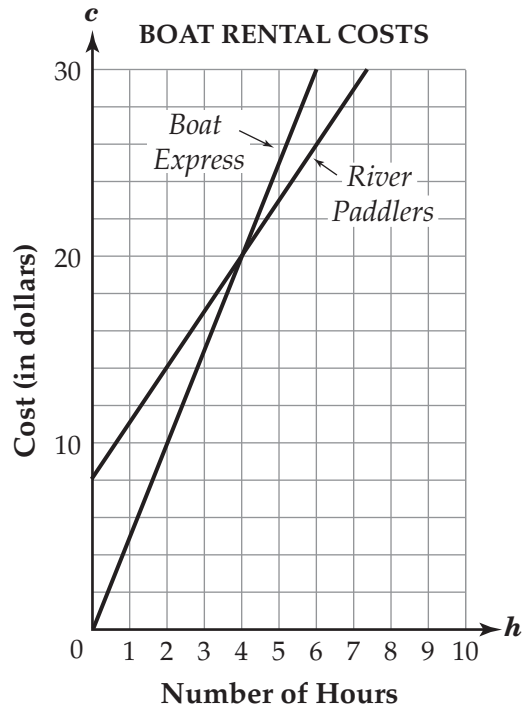- **Let a and b represent the dimensions of the gate and c represent the length of the brace.**
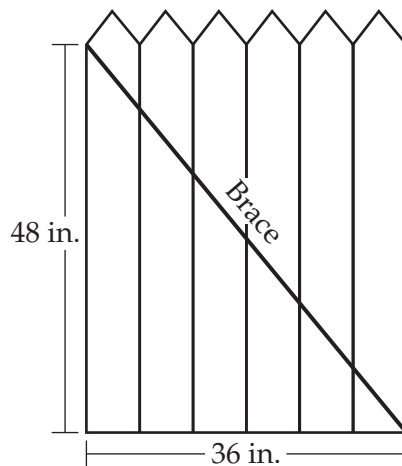
What is the length of the wooden brace?

A   60 inches

B   72 inches

C   84 inches

14 The graph below shows the cost (*c*), in dollars, to rent a boat for *h* hours at two boat companies.

At what number of hours will the cost to rent a boat be the same at both companies?

A   4

B   20

C   30

15 **A group of friends has \$18 to spend on ice cream.**

- **A small cone (x) costs \$2.**
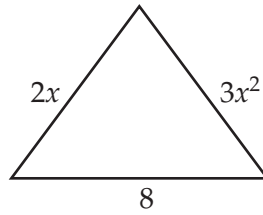
- **A large cone (y) costs \$3.**

Which inequality represents the different combinations of ice cream cones the group can buy?

A $\quad 2x + 3y \leq 18$

B $\quad 2x + 3y \geq 18$

C $\quad 3x + 2y < 18$

16 **Look at the triangle below.**

Which expression represents the perimeter of this triangle?

A $3x^2 + 2x + 8$

B $3x^2 - 2x - 8$

C $\left(3x^2\right)\left(2x\right)\left(8\right)$

17 **Fred wants to find the mean hourly wage of the students in his school who work.**

- **He asks thirty of his friends their hourly wage and calculates the mean of this sample.**

Which of these statements <u>must</u> be true?

A The sample was selected randomly.

B Bias was present in selecting the sample.

C The sample was representative of the population.

18 The scatter plot below shows the relationship between the age and value of Judy's car.

• **A curve of best fit has been drawn.**
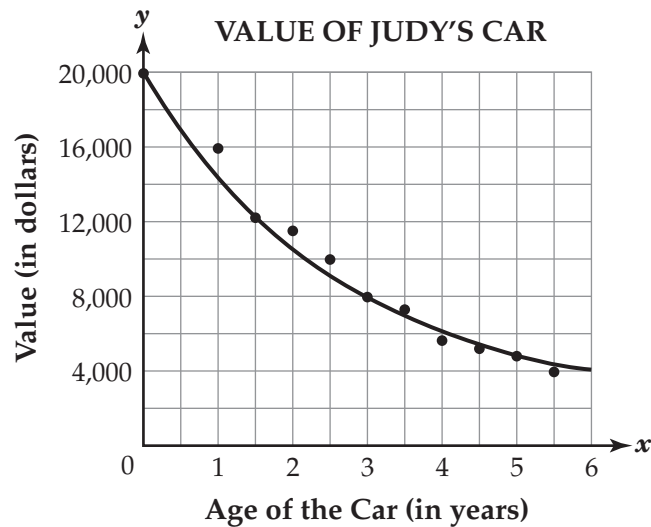
VALUE OF JUDY'S CAR

According to the curve of best fit, what was the age of Judy's car when its value was $6,000?

A 3.5 years

B 4.0 years

C 6.0 years

19 **Manuel and Felicia are comparing how much money they have.**

- **Manuel has $250.**

- **He saves $150 per week.**

- **Felicia has $1,650.**

- **She spends $200 per week.**

  - **Let x = the number of weeks**

  - **Let y = the amount of money at the end of the week.**

Which system of equations represents this situation?

A $\quad y = 250x + 150$
$\quad\quad y = 1650x - 200$

B $\quad y = 250 + 150x$
$\quad\quad y = 1650 - 200x$

C $\quad y = 250 - 150x$
$\quad\quad y = 1650 + 200x$

20 **Manuel and Felicia are comparing how much money they have.**

- **Manuel has $250.**

- **He saves $150 per week.**

- **Felicia has $1,650.**

- **She spends $200 per week.**

At the end of week 5, who has more money?

A   They both have the same amount.

B   Felicia has more.

C   Manuel has more.

21 **In the first five games of the season, a basketball team scored the following points:**

67 70 51 63 66

- **The team scored the most points in game 6.**

How many points did the basketball team score in game six to have a range of 25?

A   58

B   76

C   92

22 **A group of students went on a camping trip with 252 pounds of food.**

- **They ate 12 pounds of food each day.**

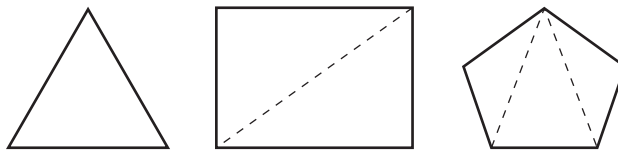**At the end of what day did they have 180 pounds of food left?**

A   6th day

B   15th day

C   21st day

23 **A triangle, a quadrilateral, and a pentagon are shown below.**

- **By drawing a diagonal from 1 vertex, the quadrilateral is divided into 2 non-overlapping triangles.**

- **By drawing the diagonals from 1 vertex, the pentagon is divided into 3 non-overlapping triangles.**

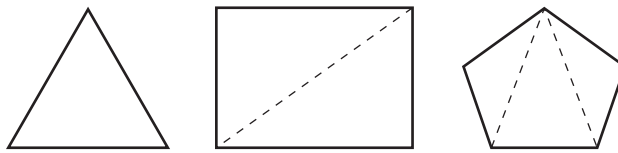- **The table below shows the sum of the angle measures of a triangle and quadrilateral.**

Polygon	Number of Sides	Number of Non-Overlapping Triangles	Sum of Angle Measures
Triangle	3	1	180°
Quadrilateral	4	2	360°
Pentagon	5	3	?

What is the sum of the angle measures of a pentagon?

A 450°

B 540°

C 720°

24 **A triangle, a quadrilateral, and a pentagon are shown below.**

- **By drawing a diagonal from 1 vertex, the quadrilateral is divided into 2 non-overlapping triangles.**

- **By drawing the diagonals from 1 vertex, the pentagon is divided into 3 non-overlapping triangles.**

- **The table below shows the sum of the angle measures of a triangle and quadrilateral.**

| Polygon	Number of Sides	Number of Non-Overlapping Triangles	Sum of Angle Measures
Triangle	3	1	180°
Quadrilateral	4	2	360°
Pentagon	5	3	?

Which equation represents the relationship between the number of sides (s) of a polygon and the number of non-overlapping triangles (t)?

A $s - 2 = t$

B $s + 2 = t$

C $s + 1 = t$

25 **A spinner is divided into 8 regions of equal size that are numbered as shown below.**
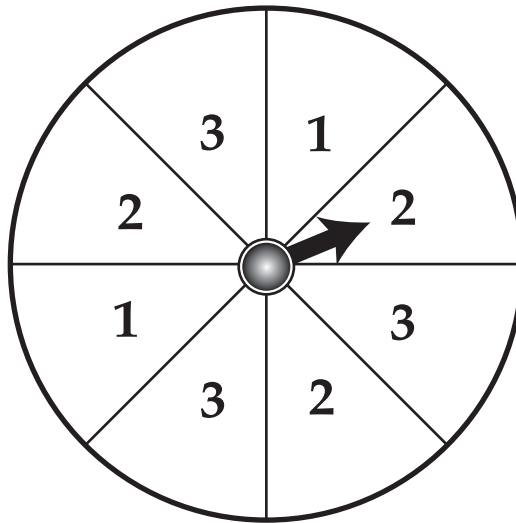
- **The spinner is spun and lands on a number.**

What is the probability that the arrow will land on the number 2?

A $\frac{1}{8}$

B $\frac{5}{8}$

C $\frac{3}{8}$

26 **Look at the pattern below.**

5, 10, 20, 40, . . .

If this pattern continues to increase, what is the 6th term?

A   60

B   80

C   160

27 **The school counselor will survey 100 students to determine which elective courses to offer next year.**

Which method will provide a <u>simple random sample</u> of the student population?

A Survey the first 100 students who enter the cafeteria on a randomly selected day.

B Have 25 teachers each randomly select 4 eleventh-grade students to be surveyed.

C Assign each student a number. Use a random number generator to generate 100 numbers. Survey those students whose numbers are generated.

28 **The table below shows the number of students in a high school by grade level.**

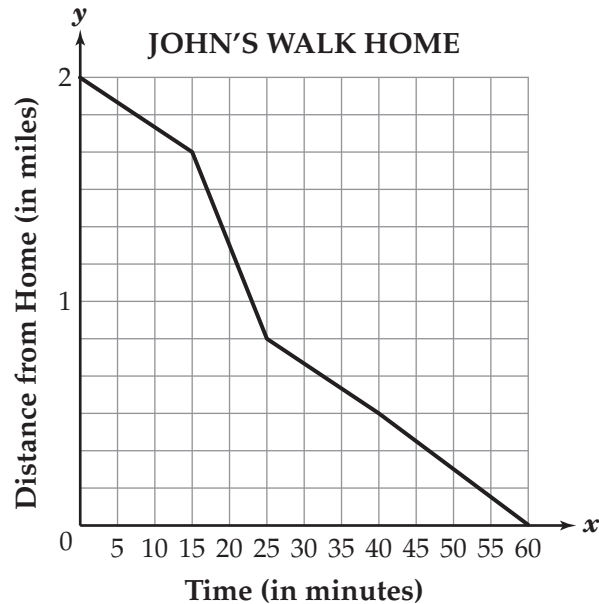| Grade Level	Number of Students
9	400
10	300
11	150
12	150

A student is selected at random.

Which spinner below would best simulate the grade level of the student?

A

C

B
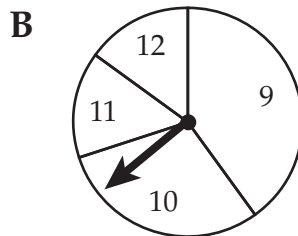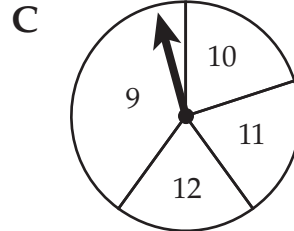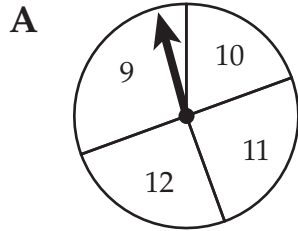
29 **John is 2 miles away from his house.**

- **The graph below shows the time it takes John to walk home.**

According to the graph, during what time interval is John walking the fastest?

A   0 to 10 minutes

B   15 to 25 minutes

C   30 to 40 minutes

30 A sample of 250 voters were asked how they would vote on the new park in the next election.

- The table below shows the results of the survey.

VOTER SURVEY RESULTS

Yes	No	Undecided
120	96	34

There are 5,500 people expected to vote in the next election.

Based on the data, how many of these 5,500 people should the mayor expect to vote "No" on the new park in the next election?

A   96

B   130

C   2,112